

**REMARKS**

Applicant thanks the Examiner for total consideration given the present application. Claims 1-9 were pending prior to the Office Action. Claims 10-21 have been added and claim 2 has been canceled through this Reply. Therefore, claims 1 and 3-21 are currently pending of which claims 3, 4, 6-9, 13, 14, and 16-19 have been withdrawn from further consideration as being directed to non-elected species. Claims 1 and 12 are independent. Claims 1 and 3-9 have been amended through this Reply. Applicant respectfully requests reconsideration of the rejected claims in light of the remarks presented herein, and earnestly seeks timely allowance of all pending claims.

**The Title of the Specification**

The Title of the Specification has been amended to recite, "Tone Control Apparatus and Tone Control Method" for further clarification.

**Election/Restrictions**

The Examiner has required an election in the present application between:

Species 1: Claims 2 and 5 drawn to the first embodiment (page 5, line 7 – page 9, line 30);

Species 2: Claim 6 drawn to the second embodiment (page 10, line 1 – page 11, line 18);

Species 3: Claim 7 drawn to the third embodiment (page 11, line 20 – page 15, line 7);

Species 4: Claims 3 and 8 drawn to the fourth embodiment (page 15, line 9 – page 18, line 3);

Species 5: Claim 4 drawn to the fifth embodiment (page 18, line 5 – page 22, line 13); and

Species 6: Claim 9 drawn to the sixth embodiment (page 22, line 15 – page 23, line 10).

**For the purpose of examination of the present application, Applicants elect Species 1, drawn to the first embodiment illustrated in page 5, line 7 – page 9, line 30 with traverse.**

**Pending claims 1 and 5 are directed to the elected species. The Examiner acknowledges that claim 1 is generic to species 1-6. New claims 10 and 11 depend from claim 1 and are drawn to the first embodiment. (See page 7, lines 19-22).**

**New independent claim 12 is directed to a method claim corresponding to the apparatus of claims of 1 and 2. Similarly, new claim 15 is a method claim corresponding to the apparatus of claim 5; new claims 20 and 21 are method claims corresponding to the apparatus of claims 10 and 11, respectively. Thus, it is respectfully submitted that new claims 10-12, 15, 20 and 21 are also drawn to the elected species (the first embodiment).**

New claims 13, 14, and 16-19 are also method claims corresponding to the apparatus of claims 3, 4, and 6-9, respectively. Thus, it is respectfully submitted that claims 13, 14, and 16-19 are drawn to the same species as their corresponding apparatus claim. Further, it is respectfully submitted that since claims 13, 14, and 16-19 depend from claim 12, **claim 12 is also generic to species 1-6.**

The several species represent embodiments of increasing complexity, where the interrelationship of the various parts are of such a nature that they cannot easily be represented as alternatives within a single independent claim or as several dependent claims referring back to one common dependent claim. However, the examiner has failed to show that the number of common features and the overall design and functionality of the several embodiments are insufficient for linking them together as alternative embodiments of one inventive concept.

Based on the above discussion, Applicant respectfully submits that the Examiner has not met his burden and has not established the absence of a “technical relationship among the inventions that involves at least one common or corresponding special technical feature”, as required by MPEP 1893.03(d). Consequently, Applicant respectfully requests that the election requirement be withdrawn.

In the event that the restriction requirement not be withdrawn, Applicant requests that upon allowance of elected independent claims 1 and 12, species 2-6 are allowed for sharing a generic claim with the elected species.

**35 U.S.C. § 102/103 REJECTION – Aso, Vahatalo, Ho**

A. Claim 1 stands rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Aso (U.S. Patent No. 5,485,543)[hereinafter "Aso"]. Applicants respectfully traverse this rejection.

First, it is respectfully submitted that Aso fails to teach or suggest each and every claimed element. For example, amended independent claim 1 now recites, *inter alia*, "wherein said filter factor calculating means and said tone control filter are independently formed by calculating said fixed filter factor prior to inputting the sound signal to the tone control filter." *Emphasis added.* Note that the element corresponding to the "fixed filter factor" was previously recited in claim 2. The Examiner rejected claim 2 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Aso in view of Vahatalo et al. (U.S. Patent No. 5,963,901)[hereinafter "Vahatalo"].

Particularly, the Examiner acknowledges that Aso fails to teach or suggest a fixed filter factor that has been calculated in advance. Thus, the Examiner imports Vahatalo to fulfill this deficiency of Aso. It is respectfully submitted that Vahatalo fails to teach or suggest the above-identified feature of claim 1.

Vahatalo discloses a conventional voice activity detection device (VAD) 4 which is used with a speech codec 3 wherein the calculation spectrum components  $S(s)$  are calculated using Linear Prediction Coefficients (LPC). LPC coefficients are calculated in the speech codec 3 using the conventional linear prediction method in which a linear filter is formed. (*See col. 5, lines 26-33.*) The VAD determines whether an input signal contains speech or background noise. (*See col. 1, lines 15-16.*) Vahatalo further discloses that for producing a VAD decision in the device shown in Fig. 2, a distance  $D_{SNR}$  between input signal and noise model is calculated in a VAD decision block 110 utilizing signal-to-noise ratio  $SNR(s)$  using seven estimated signal-to-noise value components (e.g.,  $s_1=0$ ;  $s_2=2$ ;  $s_3=3$ ;  $s_4=4$ ;  $s_5=5$ ;  $s_6=6$ ; and  $s_h=7$ ).

Vahatalo is distinguished from the claimed invention in that these noise value components are not fixed filter coefficients that are calculated prior to inputting the sound signal into a tone control filter. Rather, these noise value components are variable based on the range

of frequency components. Further, these noise value components are merely utilized in calculating a distance between the input signal and a noise model, not as filter coefficients inputted into a tone control filter as recited in claim 1.

Although Vahatalo describes a component weighting coefficient  $v_a$  in column 8, (the equation (19)), this coefficient  $v_a$  does not correspond to the fixed filter factor of the Applicant's invention, i.e., the factor for the purpose of tone control, because the coefficient  $v_a$  defines whether frequency components are important or unimportant while distinguishing between sound signal and noise in the VAD decision.

Therefore, for at least these reasons, it is respectfully submitted that the claimed invention is distinguished from Vahatalo.

Second, the alleged combination of Aso and Vahatalo would destroy the functionality of Aso. As demonstrated above, Vahatalo uses LPC coefficients and Aso uses an LMA filter (see col. 6, line 64 of Aso). As described in the "Background of the Invention" section of the instant application, an LMA filtering having a filter factor which is an LPC coefficient to which a cepstrum is converted, a ripple appears and becomes a factor to reduce the accuracy of a tone control apparatus. (*See page 2, line 28 – page 3, line 6 of the specification.*) Thus, one having an ordinary skill in the art would not be motivated to combine Aso and Vahatalo.

Therefore, for at least these reasons, claim 1 is distinguishable from Aso and Vahatalo.

B. Claim 5 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Aso in view of Ho (U.S. Patent No. 5,495,432)[hereinafter "Ho"]. Claim 5 depends from claim 1. Thus, at least for the reasons stated with respect claim 1, claim 5 is also distinguishable from Aso. Ho has not been, and indeed can not be, relied upon to fulfill the above-identified deficiency of Aso or the combined invention of Aso/Vahatalo. Accordingly, it is respectfully requested to withdraw the rejection of claim 5.

New Claims

New claims 10 and 11 are at least allowable by virtue of their dependency on allowable claim 1. New independent claim 12 is a method claim corresponding to the apparatus claim 1. Thus, at least for the reasons stated with respect to claim 1, claim 12 is also allowable. Claims 15, 20 and 21 depend from claim 12. Thus, these claims are at least allowable by virtue of their dependency on claim 12.

Claim Joinder

Since claims 1 and 12 are generic to species 1-6 and due to the fact that claims 3-4 and 6-9 depend from claim 1 and 13-14 and 16-19 depend from claim 12, upon allowance of claims 1 and 12, rejoinder of claims 3-4, 6-9, 13-14, and 16-19 is earnestly solicited.

Conclusion

In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Ali M. Imam Reg. No. 58,755 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: April 28, 2008

Respectfully submitted,

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